

# Installation Manual

## PC 2600-40-7-U

### U-Panel

#### PC 2600-40-7-U



### Overview

- 1 Side frame profile
- 2 PC-connector
- 3 PC U-Panel 2600-40-7-U
- 4 Aluminum-Endprofile
- 5 PC-cap
- 6 Fastener
- 7 Substructure by others

### Mounting situations



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### Before start of installation

Please check the complete delivery of materials and note our general information storage and installation instructions! The substructure on site must be checked for line and level before the translucent building elements are installed. For pitched roof installations a slope of at least 5° must be observed. The sealing to substructure and all fixings are not part of the Rodeca system and must be adapted to conditions on site. Anodized and powder-coated profiles can have pressure marks or drill holes due to the process. These profiles must also be trimmed on site (Fig. 1).

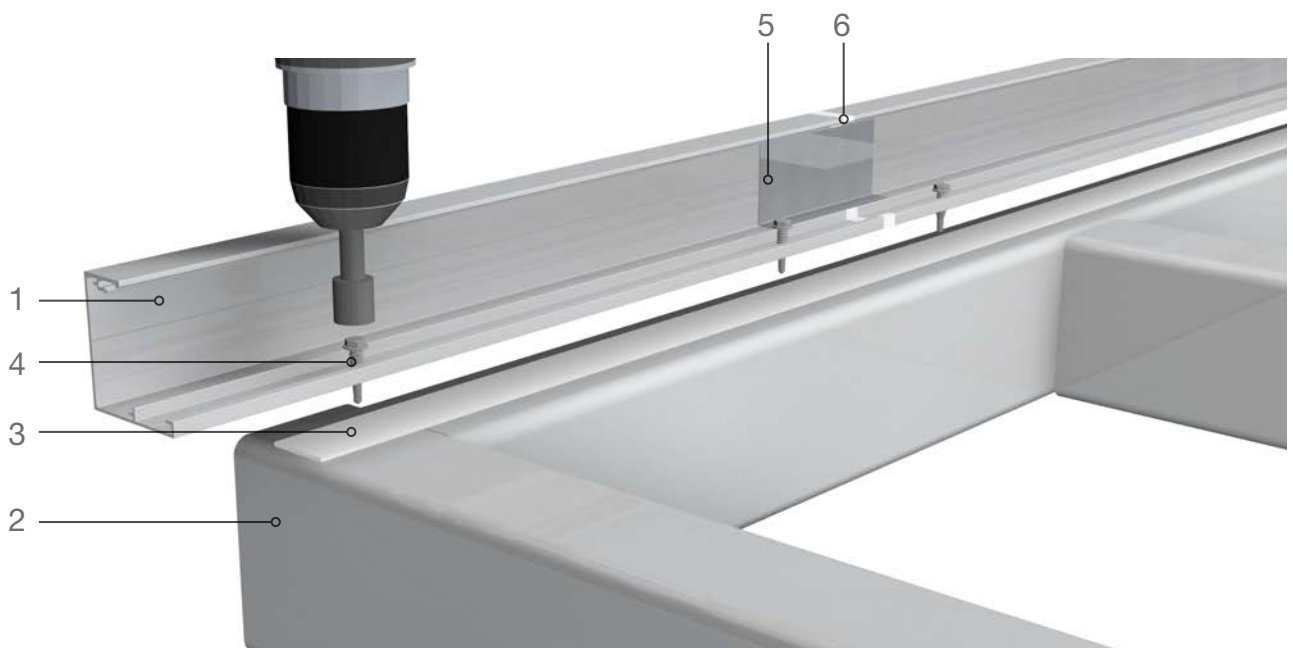


Fig. 1

### Installation of the side frame profiles

The aluminum frame profiles **(1)** are to be fixed to a suitable continuous substructure **(2)**.

All sealants to substructure are not part of the Rodeca system and must be specified on site **(3)**. Screw holes are to be pre-drilled approx. 20% larger than the screw diameter **(4)**. The distance between the fastenings should be approx. 350mm or respectively should be determined according to static requirements. We recommend the use of stainless steel screws with washers and height of the screw head not more than 5mm. The selection of screws, the proof of the aluminum profiles and the substructure must be carried out on a project-specific basis. In case of joints between aluminium profiles, the specified profile connectors **(5)** must be used, which are fixed on one side with pop rivets, small screws or similar. All expansion joints must be sealed completely with a suitable sealant **(6)**.



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U-Panels are fixed to substructure as a multi-field-construction and are connected to each other by a PC connector. The area must be averaged out before starting installation (s. Fig. 1).

The following steps are necessary in advance:

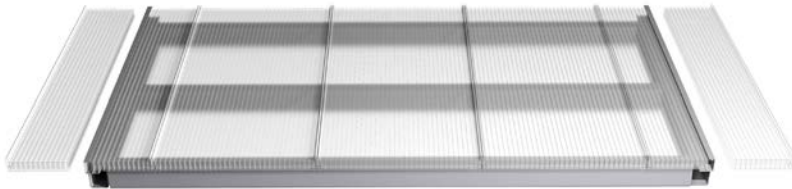


Fig. 1



Fig. 2

### Cutting

If the translucent building elements were not ordered cut to size, they have to be cut on site. The panels can be cut to length using standard tools such as jigsaws or circular saws with fine-toothed saw blades (s. Fig. 2). The protective film should remain as long as possible on the panels, i.e. as long as the installation is not hindered by the film. Any swarf particles are to be removed with oil and water-free compressed air.

### Taping

In order to minimize the penetration of dirt into the chambers of the panel, the panel ends must be covered carefully with adhesive tape (s. Fig. 3).

Rodeca recommends to seal the lower end with a vapor-permeable tape (Anti-Dust-Tape) and the upper end with Rodeca Butyl-Tape. The application instructions of the tape manufacturers must be observed. If translucent building elements are used in building projects where there is an increased amount of dust and dirt due to the environment or production, special measures must be taken. Please observe the general information on this. The protective film should be peeled away from panel ends prior to taping (s. Fig.4).

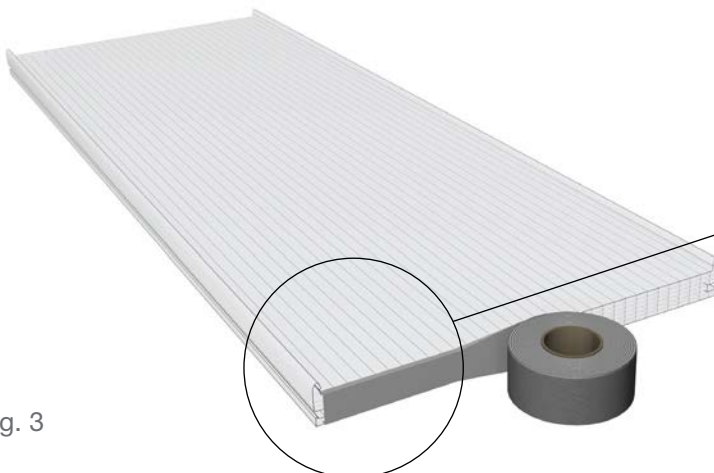


Fig. 3

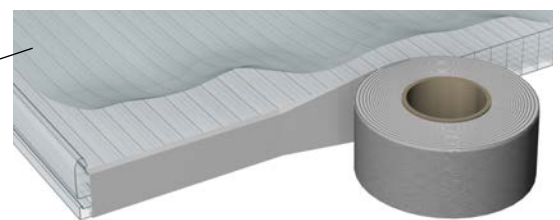


Fig. 4

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### Glazing

The protective film on the underside of the panel must be removed before assembly. The protective film on the outside (UV-protected side) can remain on the panel as protection as long as installation allows.

Cut the first panel lengthways (s.Fig.1) and push it into the side frame profile.

The fasteners are then placed on the substructure, pushed against the panel and screwed with at least 2 screws (s.Fig.2). Screws without washer and a screw head height of maximum 5mm are to be used. Please ensure that the entire fasteners surface sits fully on the substructure. Then slide the following panel into the fastener.



Fig. 1



Fig. 2

The panels are connected to one another by pressing the PC connector onto the panel couplings. If necessary softwood and a hammer can be used.

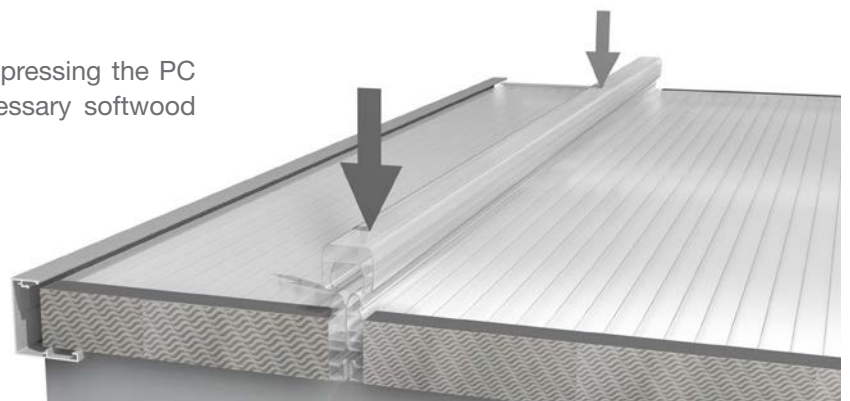


Fig. 3

### PC caps

The PC caps are all over to be provided with PC-compatible silicone and pressed onto the ends of the PC connectors (s.Fig.4).



Fig. 4

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Fig. 1

### Endprofiles

After the PC caps have been fixed, the aluminum end-profiles are to be pushed onto the masked front sides of the panels (s.Fig.1). It must be ensured that the lengths of the aluminum profiles and the lengths of the front sides match. (If necessary, shorten the aluminum profiles to the correct length). The protective film of the panels must be removed in these areas.

### Front plates

After installation of the panels, the front plates of the side profiles are mounted by inserting into the provided channel until completely locked (s.Fig.2). A softwood block and hammer can be used taking care to not damage the finish.



Fig. 2

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### External gasket

The gasket is pushed on securing the front plate via tension to the panel face. In order to compensate for shrinkage, the gasket must be installed compressed. For this purpose, loops can be formed which are later pushed into place (s. Fig.1). Ensure that the gasket locks in completely. A wooden wedge can also be used for this.

The protective film of the panels can be removed at this point.

Finally, the ends of the side frame profiles are closed with the angles 59w5025255.

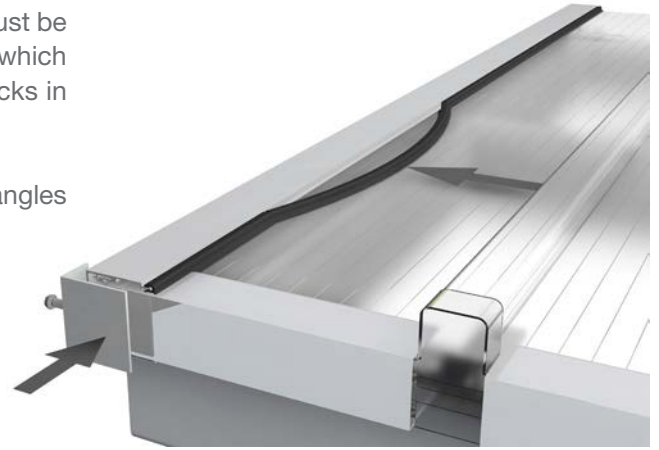


Fig.1

### On-site protection against slipping

Since the panels are slidably supported by connection with fasteners, a project-related on-site solution against slipping must be planned. For this purpose, for example, edge parts can be placed on the eaves (s.Fig.2) or the panels can be screwed to the substructure on the ridge (s.Fig.4). With short panel lengths, storm washers can also be placed on one side of panels (s.Fig.3).



Fig.2

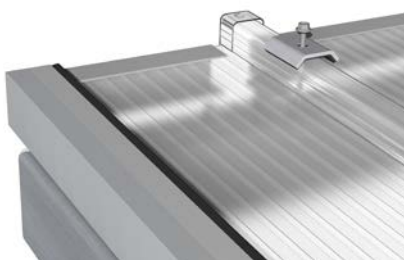


Fig.3

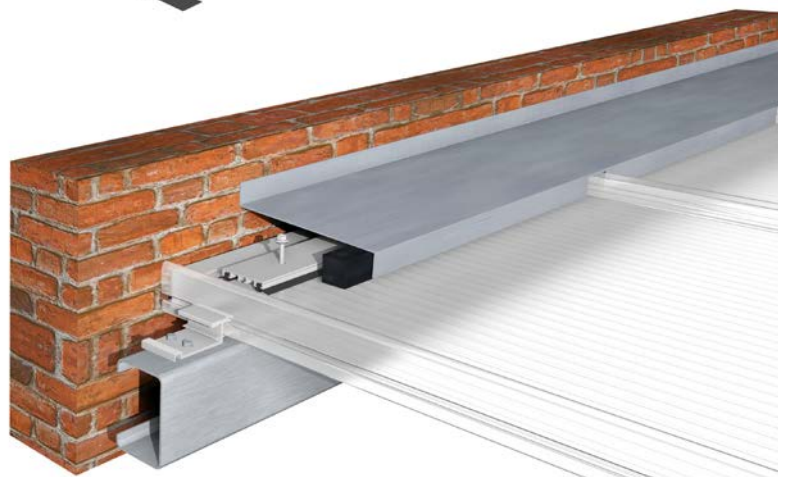


Fig.4

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### General information

#### The raw material

Polycarbonate (PC) is a crystal clear, high impact thermoplastic.

#### Advantages

Temperature resistance between -40 to +115°C, temporarily up to +130 °C

High impact resistance nearly unchanging within these temperatures

Good long term performance through UV protection

#### UV co-extrusion

With this technique a high concentrated UV protection film is homogeneously melted onto the basis material while production process.

This offers the following advantages:

- No adhesion problems of UV protection film
- Same temperature behaviour of base and UV material
- No impairment of high impact (like e.g. with coated or painted surfaces)
- Makes small cold bending radiuses possible.
- Better resistance against environmental influences and ageing.
- The thickness of the Coextrusion layer may influence the colouring.

#### Outside Performance

Through the coextruded UV-protection film – which is always applied on the outer wall and if desired (surcharge) for some of the products is also available both-sided – our products offer best weather resistance and very good long term performance.

#### Warranty

Rodeca offers 10 years warranty (according to written warranty) to its uv-coextruded products regarding to yellowing index – ageing – hail

#### Light transmission

Customized on project demand Rodeca can produce products with light transmission from almost 0% up to 80% light transmission (depending on material thickness and number of layers). Due to in-house compounding and raw material refinement special requests and colours can be realized. Please inquire project demands which vary from our standards.

#### G-Value (Solar gain value, overall energy transmittance)

The overall energy transmittance indicates how much of external solar energy reaches the interior of the room. For optimum passive use of solar energy, the g-value should be as high as possible and as deep as possible for optimum sun protection.

#### Up-values and Uf-values (heat transmission coefficient - Up=U-value panel; Uf =U-value frame)

Throughout the multi-walled design of our translucent building elements translucent facades with thermally broken aluminium profiles can be designed very energy efficient.

#### UV transmission

UV-radiation is stopped almost to 100% up to 380 Nm because of high UV-stabilization with coextruded UV-protection. The remaining transmission in the area of UV radiation is less than 1%. This property can be very important for UV sensitive goods.

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#### IR-radiation transmission

Our panels with Heatbloc-surface let through day light and reflect and stop at the same time selectively the heating radiation. The effect is cooler rooms through lower solar gain values.

#### Reflection of radar radiation

In the near of radar-units (e.g. at airports) it is important to have none or minimized influence through building elements. Rodeca products do not have influence on reflection and do not affect radar-units.

#### Service temperature

Service temperature is between minus 40 °C up to plus 115 °C (temporarily up to 130 °C). Please take into consideration service temperature especially with rain screen claddings respectively the use of dark foils for deposition of translucent building elements. Adequate distances and sufficient ventilation need to be considered in planning. That way danger of heat accumulation and associated deformations can be avoided.

#### Thermal properties

The high deformation resistance from shortly up to 130 °C is one of the advantages which Rodeca products with coextruded surface offer. Rodeca products can be used in spaces where other thermoplastics cannot be used anymore. Interesting to know is that white surfaces on roof applications already can heat up to +100°C. (It is essential to respect thermal expansion/shrinking of polycarbonate and to avoid heat accumulation.)

#### Colouring

The usual colours are:

- **Crystal** with structure for panels for higher light transmission, light refraction. Additionally the surface is less sensitive to scratches.
- **Opal** for optimized diffused light.
- **Color Series** - transparent or semitransparent colours, similar to RAL from approx. 300 m<sup>2</sup> on request
- **DuoColor** - two coloured finish of translucent building elements custom made in transparent or semi-transparent colours similar to RAL from approx. 300 m<sup>2</sup> on request

#### Qualities

Depending on application area and demand Rodeca produces different qualities.

- **LONGLIFE** quality for one sided UV protection. The terms can be extracted from our 10 years warranty declaration for LBE, MFP and U-Panels "longlife"
- **LONGLIFE PLUS** quality for one sided UV protection quality for special requirements. The terms can be extracted from our 10 years warranty declaration for LBE, MFP and U-Panels "longlife plus".

#### Impact resistance/fracture behaviour

Rodeca products made of PC are due to the raw material practically indestructible through beat, impact, stone throwing etc. Polycarbonate is 200 times more impact resistant than glass. Polycarbonate building elements do not splinter and comply with German regulations on workplaces (Arbeitsstättenverordnung).

#### Hail resistance

Currently doesn't exist a DIN standard, so our Rodeca elements were tested at EMPA (Swiss testing laboratory) with a simulated hail test with a shot radius of 20 mm and no holes occurred. According to the current testing results we achieve the highest class (class 5) of the Swiss hail test with factory-new goods.



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#### Fire resistance

Polycarbonate has a very high ignition temperature of approx. 450 °C and in case of fire the smoke development is very little. Rodeca products are classified according to the European standard DIN EN 13501 and are classified as hardly inflammable. Additionally the fire resistance of our products is classified according to various national standards. Please inquire the test certificates when needed.

#### Meltable area

In many fire protection concepts Rodeca panels are considered as melt-surface according to DIN 18230-1 because the softening point of PC is below 300°C.

#### Sound insulation

Polycarbonate panels have a sound insulation value up to 22 dB according to DIN EN ISO 10140-2. With a double wall construction a considerably higher value can be achieved. The value refers to the panel only and may differ due to structural conditions.

#### Chemical resistance

PC elements possess a very high resistance to chemicals but can be affected through some chemical bounds. Chemical resistance of polycarbonate against other used chemicals has to be checked by customer on site. This is especially important for cooling substances, lubricants, surfactants, sealants, ammonia, etc. A policy on the compatibility of polycarbonate with chemicals can be found i.a. at: <http://www.buerkle.de/en/knowhow/information/chemical-resistance.html>

#### Painting

In case that the polycarbonate panels for advertising reasons or similar will be painted or screen printed the compatibility of the painting system needs necessarily be tested from customer before use. The aluminium frame profiles can be powder coated according to the project needs. Additionally Rodeca offers the possibility to deliver TPE gaskets in custom made colours.

#### Vinyl wrap

For advertising purposes large scale letters can be glued onto the panels' surface. It is important that the foil and the glue doesn't contain substances which harm and affect polycarbonate. Please clarify before usage with the vinyl wrap supplier or the advertising company if the ingredients/glues of the foil intended to use are compatible with Polycarbonate.

#### Cleaning/Maintenance

For durable maintenance of technical and visual properties a regular care, maintenance and cleaning of the translucent building elements is mandatory. The cycles of care, maintenance and cleaning depends on the particular building site and the usage conditions.

Cleaning of translucent building elements: Pure water cleaning systems (osmosis process) have proven themselves. In addition to surface cleaning with soft brushes, if dirt is present in the area of the coupling, the deposited dirt can be cleaned using a high-pressure cleaner in conjunction with the pure water method.

Alternatively, water with a small percentage of neutral cleaning agents. No use of glass cleaner, rubbing agents or sharp edged subjects. No alkaline or tensile agents to be used.

#### Storage/Transport

Rodeca panels made of polycarbonate have to be protected before sun and wet conditions before installation and must be stored on a plain and even underground. In case of non-observance stock damages may occur. The stacking height of translucent building elements shouldn't exceed 200 cm.

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#### Packaging

The translucent building elements are delivered – depending on the finish – with one-sided or both-sided protective foil. The delivery is carried out – depending on length – from one to four pieces for hand unloading in a recyclable plastic wrapping or on pallet (for forklift unloading). Please unpack briefly before installation to avoid contamination in the hollow chambers. The protective film must be removed after processing and installation. If the Translucent Building Elements are provided with both-side protective film, the protective film on the interior side is applied as transport protection.

#### Processing

The Polycarbonate Elements can be smoothly cut with common tools, e.g. pad saw (saw blade with fine indentation) Incidental shavings are to be removed with oil free and water free compressed air.

#### Expansion/Shrinking

The expansion coefficient of polycarbonate is 0,065 mm per °C and per m and hence three times as high as the expansion coefficient of aluminium.

Rule of thumb: 3mm per m for 50 °C difference in temperature. Due to temperature differences the length and width of the panel change. The changes in length of the panel need to be considered constructional. Rodeca has considered the length expansion in its system accessories. Thermally caused corrugations can not be excluded completely.

#### Sealing

Sealings and sealing tapes need to be polycarbonate compatible and approved for usage from respective producer otherwise damages on the panels are possible.

Silicone: Must be absolutely neutral and solvent free, e. g. Rodeca PC-Silicone 2001. The aluminium profiles need to be protected (according to state of the art technique) against galvanic corrosion and an adequate sealing of building has to be done.

#### Condensation

Polycarbonate is a material that is permeable for vapour diffusion so that condensation may occur. This is not a quality defect. Depending from weather/climate this appearance is of temporary nature which is directly linked to temperature and humidity. Condensation doesn't effect the quality of the panels.

#### Formation of algae

Algae can just occur in connection of dirt and humidity. Taping of the polycarbonate panels prevents appearance of dirt while stocking and transport.

#### Sealing of panel ends

The ends of the panels must be closed before installation - directly after unpacking - with suitable sealing to avoid dust and dirt in the chambers.

With a sealing that is permeable for vapour diffusion (or permeable to water) you run risk that dust, diesel exhaust particulates, gases or other fine particles can diffuse into the panel chambers. For projects with increased particulate matter emission respectively environmental pollution are additionally precautions to be taken. With a joint sealing and additional sealing methods the optical properties of the translucent building materials can be maintained. Every element needs to be sealed singularly. A general recommendation for sealing of panel ends can't be given due to the different installation situations. The complete lack of panel ends sealing cannot be recommended from our experience.

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#### Aluminium frame profiles

Aluminum frame profiles shall be treated in accordance with the unloading and storage regulations. Mill finish aluminium with oxidative staining is not accepted as reclamation reason. Due to production reasons, the end faces of thermally separated frame profiles are to be trimmed by the customer. Coated or anodised frame profiles can have bores or discolourations of the clamping points of the anodizing process at the lateral ends and are to be shortened if necessary on site. This is not accepted as reclamation reason. Coated profiles can have color deviations to other components in the same color. The chemical resistance of aluminum must be observed. Care and maintenance of aluminum profiles can preserve the optical properties and texture.

#### Safety

The regional building regulations as well as the general safety regulations for non supporting wall and roof coverings are effective. For a perpetration (according to workplace ordinance (German „Arbeitsstättenrichtlinie“) it is mandatory to use a board of 50 cm width.

#### Tolerances according to EN 16153

Panels

Length + 12 mm (up to 3 m) / +0.40 % of panel length (above panel length of 3 m)

Thickness ± 0.5 mm

Width -2 mm / +6 mm

Weight - 5 %

Concavity length ± 5 mm per linear meter of panel length

Concavity width ± 5 mm per linear meter of panel width

Rectangularity < 5 mm per linear meter of panel length

All tolerances are based on room temperature of approx. 20 °C.

Variations in colour saturation and shade between several production batches cannot be precluded (production-related). Variations are always possible and will not be accepted as reason for complaint.

#### Disposal of waste/Environmental protection

Rodeca takes leftovers from off-cuts etc. back. Packaging is fully recyclable.

#### Joint permeability

Rodeca panels were tested on joint in terms of wind and driving rain. For complete constructions project specific blower door tests have been passed. .

#### System accessories

For almost all installation situations Rodeca supplies appropriate and well engineered accessories as well as ventilation flaps and windows in many different versions.

#### ETA (European Technical Assessment)

Rodeca panel (LBE) systems are CE marked as specified by the European directive No. 305/2011 and according to ETA 19/0452. The European Technical Assessment - ETA for short - is a European product certification. It is requested in particular for construction products for which there is no harmonized standard. At the same time, ETA authorizes a CE marking. It is mandatory that usability of single certificates is checked in advance from planner /client.

#### Environmental Product Declaration (EPD)

To enable qualified building certification, we provide an EPD for our light building elements. The Type III declaration according to ISO 14025 and EN 15804 provides reliable data on the environmental characteristics of the products and thus facilitates the sustainability assessment of buildings. Among other things, it contains important information on the life cycle of the products. This includes, in particular, the environmental key figures required for a certification scheme of buildings. These were calculated for all tongue and groove panels and shown from the cradle to the grave.

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#### Miscellaneous

Data subject to technical change.

The aforesaid information and our application technological advice in words, written and through tries, are carried out to best of one's knowledge. This information is non-binding advice even in regards to property rights of third parties. Our advice does not release you from your responsibility to proof self dependently our current advices - especially our safety data sheets and technical information - and to test if our products in regards to applicability for the intended system and use. Application, use and handling of our products – produced from you based on our application technological advice - take place out of our control and therefore you are solely responsible. The sale of our products is carried out according to our current general terms and conditions. Please check before handling if our products are applicable for the intended purpose.

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